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NOTICE OF ALLOWANCE AND FEE(S) DUE

32615 7590 07/10/2008

OSHA LIANG L.L.P./SUN
1221 MCKINNEY, SUITE 2800
HOUSTON, TX 77010

EXAMINER

GUILL, RUSSELL L

ART UNIT

PAPER NUMBER

2123

DATE MAILED: 07/10/2008

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/674,223

09/29/2003

William K. Lam

33226/323001; P9378

2511

TITLE OF INVENTION: PLI-LESS CO-SIMULATION OF ISS-BASED VERIFICATION SYSTEMS IN HARDWARE SIMULATORS

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	NO	\$1440	\$0	\$0	\$1440	10/10/2008

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.

HOW TO REPLY TO THIS NOTICE:

I. Review the SMALL ENTITY status shown above.

If the SMALL ENTITY is shown as YES, verify your current SMALL ENTITY status:

A. If the status is the same, pay the TOTAL FEE(S) DUE shown above.

B. If the status above is to be removed, check box 5b on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and twice the amount of the ISSUE FEE shown above, or

If the SMALL ENTITY is shown as NO:

A. Pay TOTAL FEE(S) DUE shown above, or

B. If applicant claimed SMALL ENTITY status before, or is now claiming SMALL ENTITY status, check box 5a on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and 1/2 the ISSUE FEE shown above.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

IMPORTANT REMINDER: Utility patents issuing on applications filed on or after Dec. 12, 1980 may require payment of maintenance fees. It is patentee's responsibility to ensure timely payment of maintenance fees when due.

PART B - FEE(S) TRANSMITTAL

**Complete and send this form, together with applicable fee(s), to: Mail Mail Stop ISSUE FEE
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INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

32615 7590 07/10/2008

OSHA LIANG L.L.P./SUN
1221 MCKINNEY, SUITE 2800
HOUSTON, TX 77010

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I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

(Depositor's name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/674,223 09/29/2003 William K. Lam 33226/323001; P9378 2511

TITLE OF INVENTION: PLI-LESS CO-SIMULATION OF ISS-BASED VERIFICATION SYSTEMS IN HARDWARE SIMULATORS

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
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nonprovisional NO \$1440 \$0 \$0 \$1440 10/10/2008

EXAMINER	ART UNIT	CLASS-SUBCLASS
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GUILL, RUSSELL L 2123 703-022000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

- ☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.
- ☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list

- (1) the names of up to 3 registered patent attorneys or agents OR, alternatively, 1 _____
- (2) the name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed. 2 _____
- 3 _____

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE (B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent) : ☐ Individual ☐ Corporation or other private group entity ☐ Government

4a. The following fee(s) are submitted:

- ☐ Issue Fee
- ☐ Publication Fee (No small entity discount permitted)
- ☐ Advance Order - # of Copies _____

4b. Payment of Fee(s); (Please first reapply any previously paid issue fee shown above)

- ☐ A check is enclosed.
- ☐ Payment by credit card. Form PTO-2038 is attached.
- ☐ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment, to Deposit Account Number _____ (enclose an extra copy of this form).

5. Change in Entity Status (from status indicated above)

- ☐ a. Applicant claims SMALL ENTITY status. See 37 CFR 1.27. ☐ b. Applicant is no longer claiming SMALL ENTITY status. See 37 CFR 1.27(g)(2).

NOTE: The Issue Fee and Publication Fee (if required) will not be accepted from anyone other than the applicant; a registered attorney or agent; or the assignee or other party in interest as shown by the records of the United States Patent and Trademark Office.

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Date _____

Typed or printed name _____

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This collection of information is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450.

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/674,223	09/29/2003	William K. Lam	33226/323001; P9378	2511
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GUILL, RUSSELL L				
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Determination of Patent Term Adjustment under 35 U.S.C. 154 (b) (application filed on or after May 29, 2000)

The Patent Term Adjustment to date is 1149 day(s). If the issue fee is paid on the date that is three months after the mailing date of this notice and the patent issues on the Tuesday before the date that is 28 weeks (six and a half months) after the mailing date of this notice, the Patent Term Adjustment will be 1149 day(s).

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (<http://pair.uspto.gov>).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

Notice of Allowability

Application No.

10/674,223

Applicant(s)

LAM ET AL.

Examiner

Art Unit

Russ Guill

2123

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 4/22/2008.
2. ☒ The allowed claim(s) is/are 1,2,6-11,15-18,20 and 21.
3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some* c) ☐ None of the:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).
- * Certified copies not received: ____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
- (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
- 1) ☐ hereto or 2) ☐ to Paper No./Mail Date ____.
- (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date ____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).**
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

- | | |
|--|---|
| 1. <input type="checkbox"/> Notice of References Cited (PTO-892) | 5. <input type="checkbox"/> Notice of Informal Patent Application |
| 2. <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 6. <input type="checkbox"/> Interview Summary (PTO-413),
Paper No./Mail Date ____. |
| 3. <input type="checkbox"/> Information Disclosure Statements (PTO/SB/08),
Paper No./Mail Date ____ | 7. <input checked="" type="checkbox"/> Examiner's Amendment/Comment |
| 4. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit
of Biological Material | 8. <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance |
| | 9. <input type="checkbox"/> Other ____. |

EXAMINER'S AMENDMENT

1. An Examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to the applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.
2. Authorization for this amendment was given in a telephone interview with Robert Lord on July 1, 2008.
3. The claims have been amended as follows:
 - a. Claim 7, line 1, the words "hardware level" have been replaced with the words --hardware--.
 - b. Claim 4 is canceled.
 - c. Claim 13 is canceled.
 - d. Claim 22 is canceled.
 - e. Claim 1 is replaced with:
 1. A method for providing verification for a simulation design, comprising:
obtaining the simulation design comprising a programming language interface system call;
obtaining a reference value corresponding to the programming language interface system call;
encoding the reference value into the simulation design to obtain a modified simulation design, comprising:
obtaining a set of hardware state elements from the simulation design;
obtaining a set of high-level state elements from a high-level design;
determining a common set of state elements from the set of hardware state elements and the set of high-level state elements;

identifying at least one relationship between the high-level state element and the hardware state element in the common set of state elements;

determining whether the at least one relationship is influenced by a test vector to obtain an influenced set of relationships; and

encoding the influenced set of relationships to obtain the modified simulation design, comprising:

obtaining high-level state element values for the high-level state elements in the influenced set of relationships from a simulation of the high-level design, and

storing the high-level state element values in an array, wherein at least one of the high-level state element values is the reference value;

compiling the modified simulation design to obtain a compiled simulation design;

and

verifying the compiled simulation design using a simulation test bench.

f. Claim 10 is replaced with:

10. A computer system for providing verification for a simulation design, comprising:
 - a processor;
 - a memory;
 - a storage device; and
 - software instructions stored in the memory for enabling the computer system to perform:
 - obtaining the simulation design comprising a programming language interface system call;

obtaining a reference value corresponding to the programming language interface system call;
encoding the reference value into the simulation design to obtain a modified simulation design, comprising:
obtaining a set of hardware state elements from the simulation design;
obtaining a set of high-level state elements from a high-level design;
determining a common set of state elements from the set of hardware state elements and the set of high-level state elements;
identifying at least one relationship between the high-level state element and the hardware state element in the common set of state elements;
determining whether the at least one relationship is influenced by a test vector to obtain an influenced set of relationships; and
encoding the influenced set of relationships to obtain the modified simulation design, comprising:
obtaining high-level state element values for the high-level state elements in the influenced set of relationships from a simulation of the high-level design, and
storing the high-level state element values in an array, wherein at least one of the high-level state element values is the reference value;
compiling the modified simulation design to obtain a compiled simulation design;
and
verifying the compiled simulation design using a simulation test bench.

g. Claim 20 is replaced with:

20. Apparatus providing verification for a simulation design, comprising:
means for obtaining the simulation design comprising a programming language

interface system call;

means for obtaining a reference value corresponding to the programming language interface system call;

means for encoding the reference value into the simulation design to obtain a modified simulation design, comprising:

means for obtaining a set of hardware state elements from the simulation design;

means for obtaining a set of high-level state elements from a high-level design;

means for determining a common set of state elements from the set of hardware state elements and the set of high-level state elements;

means for identifying at least one relationship between the high-level state element and the hardware state element in the common set of state elements;

means for determining whether the at least one relationship is influenced by a test vector to obtain an influenced set of relationships; and

means for encoding the influenced set of relationships to obtain the modified simulation design, comprising:

obtaining high-level state element values for the high-level state elements in the influenced set of relationships from a simulation of the high-level design, and

storing the high-level state element values in an array, wherein at least one of the high-level state element values is the reference value;

means for compiling the modified simulation design to obtain a compiled simulation design; and

means for verifying the compiled simulation design using a simulation test bench.

Allowable Subject Matter

4. Claims 1 – 2, 6 – 11, 15 – 18 and 20 – 21 are allowable over the prior art of record.

5. Following is an examiner's statement of reasons for allowance:

a. While Ishtiaq (U.S. Patent Application Publication 2004/0167766) teaches obtaining a simulation design comprising a programming language interface system call; obtaining a reference value corresponding to the programming language interface system call; obtaining a set of hardware state elements from the simulation design; obtaining a set of high-level state elements from a high-level design; determining a common set of state elements from the set of hardware state elements and the set of high-level state elements; identifying at least one relationship between the high-level state element and the hardware state element in the common set of state elements; determining whether the at least one relationship is influenced by a test vector to obtain an influenced set of relationships; encoding the influenced set of relationships to obtain the modified simulation design; obtaining high-level state element values for the high-level state elements in the influenced set of relationships from a simulation of the high-level design; storing the high-level state element values in an array, wherein at least one of the high-level state element values is the reference value; verifying the compiled simulation design using a simulation test bench; neither this reference alone or in combination with the prior art of record teaches a method, system and apparatus for providing verification of a simulation design, specifically including:

i. Regarding claim 1, "encoding the reference value into the simulation design to obtain a modified simulation design", "compiling the modified simulation design to obtain a compiled simulation design", in

combination with the remaining features and elements of the claimed invention;

ii. Regarding claim 10, "encoding the reference value into the simulation design to obtain a modified simulation design", "compiling the modified simulation design to obtain a compiled simulation design", in combination with the remaining features and elements of the claimed invention;

iii. Regarding claim 20, "means for encoding the reference value into the simulation design to obtain a modified simulation design", "means for compiling the modified simulation design to obtain a compiled simulation design", in combination with the remaining features and elements of the claimed invention.

6. Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Russ Guill whose telephone number is 571-272-7955. The examiner can normally be reached on Monday – Friday 9:30 AM – 6:00 PM.

8. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Paul Rodriguez can be reached on 571-272-3753. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300. Any

inquiry of a general nature or relating to the status of this application should be directed to the TC2100 Group Receptionist: 571-272-2100.

9. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Russ Guill
Examiner
Art Unit 2123

RG

/Paul L Rodriguez/
Supervisory Patent Examiner,
Art Unit 2123